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RESEARCH MEMORANDUM

EXCHANGE RATES AND THE EUROPEAN BUSINESS CYCLE: an application of a 'quasi-empirical' two-country model

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an application of a 'quasi-empirical' two-country model

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Abstract

A quasi-empirical two-country model is used to analyze the present problems of a European stagnation within an unstable European Monetary System. It integrates the q theory of investment with the approach of a portfolio choice in which both domestic and foreign agents spread their non-human wealth over imperfectly substitutable domestic and foreign share capital, domestic and foreign government bonds, domestic and foreign treasury bills, domestic and foreign time deposits and domestic and foreign money. Within the framework of floating exchange rates, rigid labour markets, sticky price and/or flexible price regimes in the goods markets, account is taken of capital accumulation, government debt and current account dynamics. The analysis shows why politicians have fundamental reasons to open to question the usefulness of a European Monetary Union within a framework of fixed exchange rates. The pros of the latter system probably are outweighed by its cons.

Keywords: Exchange rates; European business cycle; Quasi-empirical two-country model

I. Introduction

In this paper a quasi-empirical two-country model is used to analyze the present problems of a European stagnation within an unstable European Monetary System (1).
The organisation of the paper is as follows. Section II introduces a symmetric two-country model. For the considerating quasi-empirical case it represents two composite countries into which the European Community is hypothetically divided. Section III is split up into six parts (A/F). Part A contains the formulation of the ultimate aim of this article viz. to shed light upon the complex case of the present downswing of the European business cycle. In Part B attention is focused on the downswing of the European business cycle initiated by German economic policy. Starting for the present analysis from a stationary state of the German economy, financing the costs of the German unification will provoke shifting processes leading to too high nominal wage levels. The policy measures, taken by the German budgetary and monetary authorities will cause recessive effects for Germany.
In Part C a traditional trading partner of Germany will be introduced and is called for the considerating quasi-empirical case 'the United Kingdom'. In this country the social partners effectuate a normal wage level that corresponds with the developments of the average prices, labour productivity and the terms of trade. However, the British monetary desicion unit has made a deal with the German authorities to peg the Pound to the Mark. The British monetary policy is not targeting output-price stabilization, as German policy does, but is justly aiming at stabilization of the nominal exchange rate of the Pound with

respect to the German Mark. Within the framework of a sticky price regime in the British goods market, it will be explained why the policy measures, initiated by Germany, will also cause recessive effects for the United Kingdom. Thus, the latter country will become a victim of the German policy within the framework of 'fixed' exchange rates.
Part D describes why and how a 'devaluation' of the English pound, whether or not consciously effectuated by monetary policy making, may stop the process of negative growth. Two possibilities for effecting a devaluation of the English pound are discussed. The first possiblity consists of expansive M1 policy measures that are taken in a deliberate way by the Bank of England. The second possibility consists of a successful speculative action against the English Pound.
Part E summarizes in terms of 'causes and effects into two steps' why maintaining a 'fixed' exchange rate system can be very unfavourable for both countries under consideration, and why the 'flexible' exchange rate system can be extra favourable for the same countries which it concerns. Moreover, the policy scheme for an upturn of the European business cycle will roughly be outlined.
Part F merely discusses the long-term effects of a permanent (too) high level of the labour income share in case of rigid labour markets in Germany and in the United Kingdom. Within the framework of flexible exchange rates it will be shown how the Central Banks in both countries may successfully take price-stabilization policy measures. However, both countries will remain confronted with equally negative extra rates of growth of production and employment. Thus, the United Kingdom will not in a position to protect itself from the negative effects of the German policy measures, in spite of a flexible exchange rate system.
Section IV concludes the paper and stresses the benefits of a flexible exchange rate system in case of rigid EC labour markets. Flexible exchange rates can play a very useful role in mitigating the downward movement of real welfare in the downswing of the European business cycle. Moreover, the analysis also suggests that the flexible exchange rate system could play a useful role in mitigating the EC inflation rates in the event of successful introduction of a policy-mix coordination by the EC authorities aiming at an upturn of the European business cycle, in spite that the EC labour markets permanently stay rigid.
All in all, the analysis shows why politicians have fundamental reasons to open to question the usefulness of a European Monetary Union within a framework of fixed exchange rates. The pros of the latter system probably are outweighed by its cons.

II. The symmetric two-country model

The basic version of the model to be applied in the following section consists of over hundred equations and endogenous variables (Meulendijks (2)). The symmetric model at present is significantly reduced.
Variables are formulated in deviations from a trend. This trend should not be considered as being a random average path of the economy in the period of investigation. On the contrary, the initial situation of the trend is law-abiding to the rules of real and monetary growth theory. Whereas the Meulendijks' version follows the rules of a positive steady state growth, in the present model the case of a stationary state is postulated. Using the latter situation as a point of reference, the model at hand fits close of what is common in international literature (3).

Before engaging in a short discussion of some particular characteristics of the model at hand, a few additional remarks are to be made:

The two-country model can be split up into the Country A Model and the Country B Model.

Impulses and effects are measured in percentages as deviations from a stationary equilibrium; $\underline{X}_g$ and 'balance-variables' are measured in %-terms of equilibrium gross value-added in enterprises at equilibrium market prices **(GVAE)**;

By definition, it holds that $\overline{Y}=Y^a-Y^b;\overline{E}=E^a-E^b$; *etc.*
Capital letters denote nominal values, lower case letters denote volumes, prices and other variables.

The following definitions are also important for understanding the meaning of the variables in the model:

$\hat{x}$= *actual absolute value*

$\hat{x}_o$= *absolute value on stationary trend path*

$x=100\dfrac{(\hat{x}-\hat{x}_o)}{\hat{x}_o}$= *percentage cumulated extra rate of growth*

$\dot{x}$= *actual rate of growth*

$\dot{x}_o$= *(zero) trend rate of growth*

$\Delta x=(x-x_{-1})\approx\dot{x}-\dot{x}_o$= *extra rate of growth*

Appendix I contains the numerical assumptions about the ratios and elasticities for the reference situation of the postulated stationary equilibrium. Insofar as the symbols used are not explained in the present section, they still are interpreted in this appendix.

The Country A Model (the Country B Model is analogue to the Country A model):

(1) Gross value-added in enterprises (GVAE):

$$Y=\hat{\gamma}C+\hat{\sigma}_{i_b}I_b+\underline{X}_g+S_b$$

where (C), (I_b) , $(\underline{X}_g)$, and (S_b) are private consumption, gross investment, autonomous public sector expenditure (percentage of GVAE) and the balance on current account at current prices (percentage of GVAE), respectively.

(2) Private consumption:

$$C=\hat{\lambda}_n(Y+w'-t_l)+(1-\hat{\lambda}_n)Y$$

or:

$$C=\frac{8}{9}(Y+w'-t_l)-\frac{1}{9}\frac{r_o}{\hat{r}}$$

in which (w') , (t_l) , $(\frac{r_o}{\hat{r}})$ are the labour income share, the additional tax rate on wage income and the long-term real interest rate, respectively.

Consumption is determined by disposable wage and transfer income $(Y+w'-t_l)$ as well as by consumption of non-wage income earners $(C_R=Y=-\frac{r_o}{\hat{r}})$. Apart from other social benefits, disposable transfer income consists of disposable unemployment payments and disposable civil service wages. They are received from the public sector but implicitly paid by wage-tax revenues from the private sector. The additional wage-income-tax rate (t_l) explicitly depends on rational tax-policy measures with respect to the public sector financial deficit; see equation (15). As concerns the non-wage income earners, the underlying assumption is that they spend more for consumption (C_R) if national welfare (Y) increases and less if the long-term real interest rate $(\frac{r_o}{\hat{r}})$ rises.

(3) Gross investment = Stock-value of share capital

As we suppose for simplicity's case $\zeta=\frac{\hat{\sigma}_{i_b}}{\hat{\kappa}}$, it follows from equations (4) and (5) that

$$I_b=K^*=\frac{\varphi}{1+\varphi}(Y-\frac{\hat{\lambda}_n}{(1-\hat{\lambda}_n)}w')+\frac{a}{1+\varphi}[2(\overline{\overline{E}}-p_w)-(\overline{\overline{Y}}-p_w)]+$$
$$\frac{1}{1+\varphi}[2(E^b-p_w{}^b)-(Y^b-p_w{}^b)]$$

The latter relation integrates the q theory of investment with the approach of a portfolio choice between imperfectly substitutable financial assets within each country as well as across countries. The relation can be split up into two equations. Its right-hand side implies the reduced form of the monetary sector and explains the stock-value of share

capital i.e. the capital-stock market value (K^*) (Meulendijks (2)). Domestic agents implicitly spread their non-human wealth over imperfectly substitutable domestic and foreign share capital (K^*) , domestic and foreign government bonds (O) , domestic and foreign treasury bills ($\underline{Q}_g$) , domestic and foreign time deposits (Q) and domestic and foreign money (E) . Foreign agents behave like domestic agents.

The reduced form has been derived from the asset demand and supply equations. Asset demand decisions depend on the various rates of return, on the income/non-human wealth ratio as well as on a certain degree of home-preference.

The left-hand side of the relation denotes the main channel of monetary transmission to the real sector.

(4) Accumulation of capital goods:

$$\Delta k = \frac{\hat{\sigma}_{i_b}}{\hat{\kappa}}(I_b - k_{-1} - p_x)$$

By definition it holds that the extra rate of growth of the stock of capital goods is positively related to the difference between the cumulated extra rates of growth of gross investment and the actual stock of capital goods (at the beginning of the current period=at the end of the foregoing period (k_{-1})), respectively. The actual stock of capital goods will rise in case that actual gross investment exceeds the volume of scrapping of technically obsolete capital goods.

(5) Tobin's q type of gross investment:

$$\Delta k = \zeta(K^* - k_{-1} - p_x)$$

The main channel of monetary transmission to the real sector is Tobin's q i.e., in the present model the difference between the capital-stock market value and its replacement value is an important determinant of gross investment. There are many ways to explain the Tobin's q transmission (Meulendijks, (2)). Besides, and the literature deals with this circumstance (see for instance, van Els, (1)), there is as yet very little empirical knowledge about the elasticity of investment (ζ) with respect to Tobin's q. Probably, this is due of a lack of information that should be given by the National Offices of Statistics. In order to justify the use of Tobin's q in the model at present where it has a clear impact on the analysis results, we may quote a recent Dutch study in which the empirical actuality in the Netherlands of the q-theory of investment has been confirmed (Driehuis and Mulder, (4)).

(6) Balance on current account and at current prices (percentage of GVAE):

$$S_b=-\hat{\mu}\mu_y\bar{\bar{y}}-(2\eta-1)\hat{\mu}(\bar{\bar{p}}_y-p_w)$$

where $(\bar{\bar{y}})$, (p_w) and $(\bar{\bar{p}}_y-p_w)$ are production differences between both countries, the nominal exchange rate and the terms of trade, respectively.

(7) Total balance of payments (percentage of GVAE)

$$S_u=0=(2a-1)S_b-(1-a)(\hat{\kappa}+\hat{\omega})\hat{r}(\bar{\bar{Y}}-p_w)+$$
$$(1-a)(\hat{\kappa}+\hat{\omega}+\hat{\chi}-\hat{\kappa}\hat{\delta})2a[-2(\Delta\bar{\bar{E}}-\Delta p_w)+(\Delta\bar{\bar{Y}}-\Delta p_w)]$$

Although the latter equation draws on Meulendijks (2), in the present case the yield on share capital $(\hat{r}_i^*)$, the real interest rate on public sector debt $(\hat{r}_o)$ and the short-term real interest rate $(\hat{r}_q)$ are assumed to be equal in absolute value on the stationary trend path. Thus, the average rate of return $(\hat{r})=(\hat{r}_i^*=\hat{r}_o=\hat{r}_q)$.

International capital movements are free, but the international capital mobility is imperfect. The nominal exchange rate is flexible and follows from the foreign-currency-market equilibrium of the non-monetary sectors $(S_u=0)$.

(8) Price change of output enterprises:

$$\Delta p_y=\xi(y-y')$$

in which (y') is production capacity.

In the goods market we distinguish two alternative regimes, viz. the sticky price regime $(\xi=1)$ and the flexible price regime $(\xi=\infty)$. In both cases output-price changes depend on the utilization rate of production capacity. In the sticky price model, production may deviate from the level of production capacity. In the flexible price model, production instantaneously equals production capacity.

(9) Production of enterprises equals (inefficient) employment in enterprises:

$$y=Y-p_y=l$$

where (l) is employment. For the case of simplicity, labour productivity $(y-l)$ is assumed to remain unchanged.

(10) Production capacity of enterprises:

$$y'=k_{-1}-\phi\frac{\hat{\lambda}_n}{1-\hat{\lambda}_n}w'$$

On the supply side of the goods market, productive capacity is positively related to the stock-volume of capital goods (at the beginning of the current period = at the end of the foregoing period) and negatively related to real labour costs per unit of output in enterprises (w') . Imperfect substitution between the two factors of production is postulated.

(11) Price of expenditure categories:

$$p_x=p_y-\hat{\mu}(\overline{\overline{p_y}}-p_w)$$

The price of commodities is homogeneous with respect to the output price and the price of imports (in domestic currency terms).

(12) Yield on share capital:

$$\frac{r_i^*}{\hat{r}}=Y-\frac{\hat{\lambda}_n}{1-\hat{\lambda}_n}w'-K^*$$

By definition it holds that yield on share capital equals the difference between nominal profits in enterprises and the capital-stock market value.

(13a) and (13b) Long-term real and short-term real interest rates:

$$\frac{r_o}{\hat{r}}=[O-a\{2(\overline{\overline{E}}-p_w)-(\overline{\overline{Y}}-p_w)\}-2(E^b-p_w^b)+(Y^b-p_w^b)]:\varphi$$

$$\frac{r_q}{\hat{r}}=[Q-a\{2(\overline{\overline{E}}-p_w)-(\overline{\overline{Y}}-p_w)\}-2(E^b-p_w^b)+(Y^b-p_w^b)]:\varphi$$

where (O) and (Q) are the stocks of government bonds and time deposits, respectively. These two equations draw on Meulendijks' portfolio subsystem (see note (2)). The long-term real interest rate equals the real interest rate on public sector long-term debt (government bonds). The short-term real interest rate equals the real interest rate on the public sector short-term debt (treasury bills). It also equals the real interest rate on time deposits.

(14) Public sector financial deficit including interest payments on public debt (percentage of GVAE):

$$-F_g=\hat{\omega}\Delta O+\hat{\chi}\Delta\underline{Q}_g=\underline{X}_g-\hat{\lambda}t_l-(\hat{\kappa}+\hat{\omega})\hat{r}t_R'-\hat{\tau}_R\hat{\kappa}\hat{r}(Y-\frac{\hat{\lambda}_n}{1-\hat{\lambda}_n}w')+\hat{\omega}\hat{r}(O+\frac{r_o}{\hat{r}})$$

This relation implicitly states that short-term lending by the public sector $(\underline{Q}_g)$ is by balance for nothing.

If rational tax policy is defined as

$$-F_g=0$$

the additional tax functions read

(15) The additional tax rate on wage income (percentage of private sector primary wage income):

$$t_l=0.5w'+\frac{1}{\hat{\lambda}}\underline{X}_g$$

(16) The additional rate of taxes on non-wage income (percentage of disposable non-wage income):

$$t_R'=-\frac{4}{3}w'-\frac{2}{3}E$$

The additional wage-income tax rate positively depends on real labour costs per unit of output in enterprises and on autonomous expenditure impulses initiated by the public sector. The additional non-wage tax incidence is a straightforward consequence of the endogenous wage-income-tax process in case of a change of the labour income share and also is a result of the M1 policy by the Central Bank and/or the government (= the public sector). In case that speculation on the foreign exchange markets is successful, the induced money creation might have its own influence on this taxation process; see

equation (19).

(17) Wage and salary bill per worker in enterprises:

$$p_l = p_y + y - l + \epsilon t_l + \underline{p_l}$$

Nominal wages are determined by output prices, labour productivity, shifting effects of the burden of an additional wage taxation and an autonomous wage term, which represents the influence of wage policy as agreed, whether or not in a conscious way, by the labour market parties. Apart from the latter three determinants, this equation implicitly states that the price of expenditure categories and the terms of trade are absorbed in the nominal wage formation. Effects of labour market tensions on wage formation are assumed to be absent because of the prevailing high European unemployment levels in recent years. Thus, the present analysis deals with labour market rigidity at home and abroad.

(18) Labour income share equals real labour costs per worker in enterprises:

$$w' = p_l - p_y - y + l = w_y$$

This is because labour productivity does not change; see equation (9).

(19) M1 stock of money (E) is made up of

Speculative money:

$$(E_s)$$

and

Transaction money:

$$(E_T)$$

Thus:

$$E = \underline{BEL} + \underline{Q_g} + \textit{Speculative profits} = \frac{1}{2}E_s + \frac{1}{2}E_T = \frac{1}{2}E_s + \frac{1}{2}Y$$

where $(\underline{BEL})$ and $(\underline{Q_g})$ are the Central Bank M1 policy and the public sector short-term lending policy, respectively. Transaction money equals gross value-added in enterprises. Thus, the velocity of circulation of transaction money remains constant.

(20) (M2-M1) stock of money consists of time deposits (Q):

$$Q = \underline{Q_g} + \textit{Speculative profits}$$

Note that time deposits (Q) are influenced by the total short-term lending to the public sector ($\underline{Q_g}$) and by the speculative profits, but **not** by the Central Bank M1 policy ($\underline{BEL}$) .

III. How exchange rates can play an important role in the downswing and the upturn of the European business cycle

Part A: Formulation of the problem

In an earlier study on the European integration process from EC to EMU a centralization of EC policymaking was recommended (2). A fully autonomous national policymaking should be forbidden. However, there are practical as well as theoretical reasons why unilateraly, but cooperatively, taken 'compensatory price, wage, budgetary or monetary policy-measures' are unavoidable.
What may happen if this recommendation is not taken seriously by the different national decision authorities can be demonstrated by analyzing the present problems of a European stagnation within an unstable European Monetary System. Last year this instability came to the surface: the European foreign currency market was in severe turmoil. Germany and the United Kingdom played a leading role in this economic-political drama. Speculative agents were given a great deal of room on the exchange markets and, as usual, politicians and bankers viewed this situation as an immoral one. One of the questions to be discussed concerns the appropriateness of this point of view.
In the following parts of this section the complex case of the present downswing of the European business cycle will be analyzed as well in which two large open countries, for instance, Germany and the United Kingdom, have probably played a dominant part. Using the symmetric two-country model in section II, results will be derived which correspond strikingly with the poor economic performance Western Europe is confronted with nowadays. Theoretically speaking, the EC decision units concerned can be offered a solution in order to create the necessary upturn of the European business cycle in the near future. At least politicians can learn from what the reversed signs of the negative results to be presented later have to tell (see Tables Ia and Ib).

Part B: The downswing of the European business cycle initiated by German economic policy

The attention is focused on a (large) open country and for the considerating quasi-empirical case this composite country is called 'Germany'. As is usual in capitalistic countries, in this economy the wage, budgetary and monetary policy measures are left uncoordinated. Any of the three important decision units has its proper responsibility. The two Unions of the labour market decide on the levels of (collectively agreed) nominal

wage contracts. The government consequently decides on the tax rate levels aiming at a desired level of expenditures by the public sector and the desired financial deficit. Finally, the 'German Bundesbank' takes monetary policy measures aiming at stable production prices.

Starting for the present analysis from a stationary state of the German economy, nominal wages are increased in consequence of the German unification that has been suddenly realised recently. A nominal wage increase in Germany while the price of production and labour productivity are maintained at a constant level implies an increase of the real labour costs per unit of output in enterprises. Thus, Germany is confronted with an autonomously induced wage impulse. It will affect the production capacity of enterprises negatively (5). If production were also lowered (or perhaps maintained at a constant level), but initially at a lower speed as production capacity is decreasing, prices would tend to rise. However, an actual rise of prices is prevented by contractive monetary policy measures. Nevertheless, the M1 contraction in order to maintain price stability will cause higher interest rates. Moreover, the profitability of enterprises will be lowered by an increase of the real labour costs per unit of output and will affect the level of investment.

At unchanged tax rates, this policy would imply a higher financial deficit of the German government because non-wage tax revenues will become lower whereas interest payments on public debt will increase. Higher non-wage tax rates are irrational because they also affect the profitability of enterprises. Therefore a rational tax policy is likely to imply lower non-wage tax rates if the labour income share of enterprises increases.

Because the German government is aiming at a constant financial deficit of the public sector, raising the rate of taxes on wage income is the only rational way to realize this. The possibility of lowering the necessary governmental expenditures, needed for the German unification, is excluded. Thus, the extra burden of taxation on wages will imply that the disposable wage income is not increasing, in spite of the initial rise of the nominal wage level. All in all, the level of consumption from wage income will hardly be affected because of the lower prices of imports inducing a lower price of expenditure categories. Higher interest rates and the lower profitability of enterprises surely affect the level of consumption from non-wage income. However, its relatively small importance for the total level of private consumption will imply that private consumption is hardly affected in a downward direction.

Only two expenditure categories remain for matching demand and supply in the goods market, viz. gross investment and the balance on current account (at constant prices). Higher interest rates on commercial loans and a lower profitability of enterprises will lower the level of investment. The balance on current account will be affected too in a downward direction because of a deterioration of the German competitive force, and of course because the rate of decrease of the German level of domestic expenditures falls short with the rate of decrease of production capacity. At current prices, however, the balance on current account is not affected. A lower balance on current account at constant prices is fully compensated by the ameliorated terms of trade.

Unemployment in Germany will increase to a significantly higher level and will continuously rise in consequence of a too low level of investment.

A low level of domestic investment also affects the German balance on capital account in a downward direction. But, the reverse development can be recognized with respect to the balance on capital income account.

The total balance of payments (of the non-monetary sectors) will be in equilibrium of

course in the event of flexible exchange rates.

Part C: The United Kingdom as a victim of the German policy within the framework of 'fixed' exchange rates

A traditional trading partner of Germany has been introduced and for the considerating quasi-empirical case this composite country is called 'the United Kingdom'. It represents all other countries in Western Europe in so far they were or still are confronted with exchange rate difficulties. In this composite country the social partners effectuate a normal wage level that corresponds with the developments of the average prices, labour productivity and the terms of trade. Besides, the 'British' monetary desicion unit has made a deal with the German authorities to peg the Pound to the Mark by using monetary policy measures. Actually, this is because the United Kingdom initially is a member of the EMS in which the DM plays a role of an anchor currency. Consequently the Bank of England has to adopt a monetary policy which matches the constant ratio requirement of its currency with respect to the Mark. Thus, the British monetary policy is not targeting output-price stabilization, as German policy does, but is justly aiming at stabilization of the nominal exchange rate of the Pound with respect to the German Mark (6). The same authority tries to stabilize its financial deficit, in spite of the higher burden of interest payments on government debt, using non-wage-tax policy measures. The latter policy actions are also taken in Germany. But in this country, wage-tax policy measures are preferred because the non-wage income share has already been decreased.

Two possibilities can now be discussed:

The first case deals with the sticky price regime in the goods market of the United Kingdom and the second case is referred to as a dominant flexible price regime in this country. The first possibility implies that the degree of utilization of profitable production capacity may be lower than 100 %; this is because prices are not flexible enough. Using the flexible price case, prices are flexible and even they are instantaneously flexible in the present paper.

It is easy to understand why the sticky price case is to be preferred to the flexible price regime in the case of a threatening underutilization of production capacity. A lower actual level of production than production capacity would allow is always possible. However, in the second case of a threatening overutilization of production capacity, the postulate of the flexible price regime is to be preferred because a higher level of production than 'profitable' production capacity allows is useless.

The policy measures, initiated by Germany, cause recessive effects for the United Kingdom since it maintains exchange rate stability with respect to the DM. So, it is obvious that the latter country is dealing with the sticky price regime.

The distinction between sticky price vs flexible price regimes is not important from the German policy makers' point of view because their monetary policy measures are aimed at stabilization of the domestic prices of production. Together with a lack of wage costs determinants in the price formation equation, it implies that the domestic results of the German policy measures are the same for both alternatives of price formation in the goods market.

The recessive effects in the United Kingdom can be explained in more detail as follows.

The necessary English contractive monetary policy implies a significant slow-down of production as a result of the postulated sticky price model. The low value of 1 for the elasticity of the output price with respect to the utilization rate of production capacity

implies, moreover, decreasing nominal wages and prices. In percentage terms, their decreases equal the decrease of production. The latter percentage amounts to half of the M1 contraction % effectuated by the English monetary authorities aiming at exchange rate stabilization of the English pound.
The English competitive position improves and the imports from Germany decrease as a result of the slow-down of production. A positive balance on current account (at constant prices) will finally be realised, in spite of decreasing exports to Germany. However the balance on current account at current prices will be unchanged in consequence of the deterioration of the English terms of trade.
The combination of a significant slow-down of total demand and production in the goods market and a positive English trade balance implies that two expenditure categories are seriously affected by the English contractive monetary policy, viz., those of private consumption and private investment. This is not only due to the higher interest rates. The seriously decreased purchasing power in the English domestic goods market can be considered as an even more important reason. The latter deterioration has been caused by an insufficient decrease of the price of expenditure categories compared with the significant decreases of the English nominal wages and non-wages.
The foregoing analysis indicates why the United Kingdom has explicitly become a victim of its own political conduct by keeping itself to the promise of maintaining the exchange rate of the English pound constant with respect to the Deutsch Mark. This is especially true if Germany, as an anchor country, takes contractive monetary policy measures exclusively aimed at its **national** policy targets.

Table Ia: The downswing of the business cycle
(period 1; impulses and effects are extra rates of growth measured in percentages)

In Germany:	Wage impulse, tax increase and M1 contraction			
In the United Kingdom:	a) M1 contraction aiming at exchange rate stabilization of the english Pound b) and subsequently depreciation of the English Pound by using money creation			
Variables/Countries	**Germany**		**United Kingdom** (Sticky-Price Model)	
Instrumental variables or Impulses	**a)** in %	**b)** in %	**a)** in %	**b)** in %
1a: Nominal wage impulse	5/7	0	0	0
1b: Autonomous expenditure impulse of the public sector (in percentage points of GVAE)	0	0	0	0

2:	Rate of taxes on wage income in % of private sector primary wage income	0.5	0	0	0
3:	Rate of taxes on non-wage income in % of disposable non-wage income	-0.8	0	1.6/3	-1.6/3
4:	Money creation of the Central Bank	-0.8	0	-0.8	(0.8) *
5:	Money creation by speculation	0	0	0	0.8
	Target variables or Effects	**a)** in %	**b)** in %	**a)** in %	**b)** in %
1:	Production and employment in enterprises	-0.8	0	-0.4	0.4
2:	Price of output enterprises = price of exports	0	0	-0.4	0.4
3:	Nominal exchange rate	0	-0.8	0	0.8
4:	Volume of private consumption	-2.3/9	0.1	-4.5/9	0.3
5:	Public sector financial deficit including interest payments on public debt in % of GVAE	0	0	0	0
	Remaining Variables	**a)** in %	**b)** in %	**a)** in %	**b)** in %
6:	Wage and salary bill per worker in enterprises	1.0	0	-0.4	0.4
7:	Real labour costs per unit of output in enterprises = labour income share in terms of GVAE	1.0	0	0	0
8:	Real disposable wage and salary bill per worker in enterprises	-0.2	0.1	-0.5	0.3
9:	Price of imports in terms of domestic currency	-0.4	-0.4	0	0.8
10:	Price of expenditure categories	-0.1	-0.1	-0.3	0.5

11: Terms of trade in % of GVAE	0.1	0.1	-0.1	-0.1
12: Volume of exports of goods and services	-0.8	0	-0.4	0.4
13: Volume of imports of goods and services	-0.4	0.4	-0.8	0
14: Balance on current account at constant prices in % of GVAE	-0.1	-0.1	0.1	0.1
15: Balance on current account at current prices in % of GVAE	0	0	0	0
16: Volume of gross investment	-4.7	0.1	-0.5	0.3
17: Stock of capital goods (volume at the end of the period)	0.235	0.005	-0.025	0.015
18: Production capacity of enterprises	-0.8	0	0	0
19: Nominal value of GVAE	-0.8	0	-0.8	0.8
20: Nominal market value of the stock of share capital	-4.8	0	-0.8	0.8
21: Nominal market value of long-term public debt	0	0	0	0
22: Nominal value of time deposits	0	0	0	0.8 (0)*
23: Real interest rate on long-term public sector debt	0.8	0	0.8	-0.8
24: Yield on share capital	-4.0	0	0	0
25: Real interest rate on time deposits and commercial bank loans	0.8	0	0.8	0 (-0.8) *
26: Private sector disposable nominal income	-0.52	0	-0.92	0.72
27: Private sector savings in % of GVAE	-0.2	0	-0.2	0

28:	Nett investment in % of GVAE	-0.4	0	0	0
29:	Balance on capital account on account of share capital in % of GVAE		0	0.2	0
30:	Balance on capital account on account of public sector bonds in % of GVAE	0	0	0	0
31:	Remaining balances on capital account in % of GVAE	0	0	0	0
32:	Balance on capital income account on account of share capital yields and real interest revenues of public sector bonds	0.2	0	-0.2	0
33:	Total balance of payments of the non-banking sector	0	0	0	0
34:	Utilization rate of production capacity of enterprises	0	0	-0.4	0.4
35:	**Balance Sheet Control:** the financial components of the definitial relationship between the Banks, the Central Bank, the Public Sector and the Private Sector sum up to zero.	0	0	0	0

* Effects denoted between brackets concern %-changes in consequence of a deliberate expansive M1 policy

Table Ib: The long-term effects of a too high level of the labour income share, a rigid labour market and a price-stabilization policy in both countries
(Results concern extra rates of growth *)

Definition	Country:	Germany		United Kingdom	
	Period:	1	∞	1	∞
	Cases:	a)+b)	a)+b)	a)+b)	a)+b)
Variables		in %	in %	in %	in %
Impulses		in %	in %	in %	in %
Nominal wage impulse		5/7	0	0	0
Money creation by Central Banks		-0.8	-0.12	0	-0.12
Effects		in %	in %	in %	in %
Production and employment in enterprises		-0.8	-0.12	0	-0.12
Price of output enterprises		0	0	0	0
Nominal exchange rate		-0.8	0 (-9.6)*	0.8	0 (9.6)*
Stock of capital goods (volume at the end of the period)		-0.23	-0.12	-0.01	-0.12
Labour income share		1.0	0 (1.0)*	0	0 (0)*
Terms of trade in % of GVAE		0.4	0 (4.8)*	-0.4	0 (-4.8)*

* The results denoted between brackets concern the cumulated extra rates of growth and explain the ultimate level as a deviation from initial trend value of the corresponding variable.

Part D: A 'devaluation' of the English pound, whether or not consciously effectuated by monetary policy making

Although the domestic prices of expenditure categories will decrease in both countries (in Germany because of lower prices of imports and in the United Kindom because of lower output prices) the public demand for a devaluation of the English pound will become louder. The resulting change in the exchange rate may stop the process of negative growth and it will surely be a realistic alternative since the United Kingdom is confronted with the sticky-price regime in the goods market. There are two possibilities for effecting a devaluation of the English pound with respect to the Deutsch Mark.

The first possibility consists of expansive M1 policy measures that are taken in a conscious way by the Bank of England. (Note that these policy measures are taken after the period during which the Bank of England has pursued a contractive M1 policy aiming at exchange rate stabilization of the English pound.)

However, in order to realise this possibility, the British authorities must first convince the German authorities of its profitability for both countries. As stated, it is easy to understand why it may be profitable if the sticky-price regime dominates the English goods market. Under such circumstances, the devaluation of the English pound will cause higher levels of production in the United Kindom. They are profitable too for the private expenditure categories in Germany because they are partially transmitted by an amelioration of the German terms of trade. However, it also means that German competitive power is worsened again. German exports will initially decline, but afterwards they will return to their initial level since higher English production levels will induce higher English imports equaling higher German exports.

Without explicitly mentioning them, there are many reasons why the English authorities will wait to ask the necessary permission of the German authorities for actually carrying out such a profitable devaluation. If speculative agents consider this too long they will aim at speculative profits and may successfully realise them if the Bank of England's foreign reserves fall short of the speculative agents' demand for the Deutsch Mark. This second possibility of the Pound's devaluation has been made possible by the Bundesbank authorities. Their lack of sufficient financial help to the Bank of England may be the only reason why the British foreign currency reserves could be exhausted by speculation. Thus, speculation can be a proper source of money creation without extra M1 policy measures taken by the Central Banking Authorities or without an extra short-term lending policy by the governmental authorities.

The equaling percentage rates with regard to the aforementioned 'speculative' devaluation and money creation are essentially unknown. For convenience's sake, we shall fix them on the same level we could derive for the depreciation-% of the English pound in the event of a deliberate British policy of non-monetary-intervention as a response to the German policy action described in Table Ia, but without 'an earlier promise' to peg the Pound to the Deutsch Mark (and of course, without speculative intervention). The results in the latter situation equal those which can be derived by adding up the 'two-step' results of our actual case as denoted in the a) and b) columns of Table Ia.

It is noteworthy that both possibilities of the Pound's devalution and the subsequent money creation in the United Kingdom ultimately do not affect the quantity of money in Germany. Thus, the usual Bundesbank's 'inflation' arguments for refusing the necessary credit facilities to the Bank of England do not hold.

All in all, under exceptional circumstances, speculative actions are morally allowed. This conclusion certainly holds if the monetary authorities concerned wait too long to act in order to change the exchange rate. If a fixed exchange rate causes a heavy stagnation, a flexible change of this rate can be a useful solution for all partners. It is because of the Central Banks' weakness if they have to take their losses in case a devaluation occurs due to the speculative agents on the foreign exchange market.

Part E: The policy scheme for an upturn of the European business cycle

After discussion of the causes of the downswing of the European business cycle, the reversed signs of the results shown in Table Ia may roughly outline the necesary policy measures to be taken for an upturn of the European business cycle.
The effects of various impulses on endogenous variables in period 1, as are shown in Table Ia, underline our remarks for the first period with regard to the present downswing of the European business cycle. Not only are the percentage values of the variables important, but also their signs. Our qualitative way of arguing depends on these signs. They may be positive, negative or zero.
All in all, we have already concluded that a fixing of nominal exchange rates will be unprofitable for the United Kingdom as well as for Germany; **See the two a)-columns of Table Ia**. What will happen if the English monetary authorities still decide to change their earlier course and consciously effect a devaluation of the English pound has been shown **in the two b)-columns of Table Ia**. Moreover, the latter results roughly indicate why under specific circumstances a successful devaluation by speculative operations on the foreign exchange market can also be profitable for both countries.
In the United Kingdom the interest rates will be lowered and the underutilization of production capacity will diminish. The English rate of unemployment can be lowered too.
In Germany the level of production will be maintained, but the devaluation of the English currency appears to be profitable for the German consumers because of the ameliorating terms of trade. In spite of a worsening competitive power, the German level of exports can be maintained since the higher English level of production will induce higher imports from Germany. The German imports from the United Kingdom will also increase because they have become cheaper in terms of the Deutsch Mark.
Nevertheless, a devaluation only appears to be a partial solution for the European troubles, as we can actually observe nowadays.
Reversing the signs of the Table Ia-figures will provide a policy scheme that probably is useful for an integral European solution. It roughly suggests the dire necessity of a strong coordination of price, wage, budgetary and monetary policy by the EC authorities. In particular, the combination of moderated nominal wages, lower tax rates, unchanged financial deficits of the EC governments and expansive monetary policy measures by the EC Central Banks seems to be the only realistic policy-mix in order to initiate the necessary upturn in at least Western Europe.

Part F: The long-term effects in the event of a rigid labour market

The long-term results of the analysis, as shown in Table Ib, indicate what will happen in Germany and the United Kingdom if both labour markets permanently remain rigid. In addition, from a qualitative point of view the same figures also indicate the fate which other EC countries will have to share with them.

Rigid labour markets imply sustained excessive labour income shares from the beginning period in which these excessive shares are effected. In spite of the continuously rising unemployment rates, they will remain unchanged.
In the example a flexible exchange rate system is postulated which allows the two Central Banks to stabilize their domestic prices of production, regardless to the consequences for the nominal exchange rate of their domestic currencies.
In the latter case and as a consequence of a continuously decreasing capacity of production, the monetary policy has to be a permanently contractive one. The initial highly negative rate of growth of the German production capacity will gradually be lowered, whereas the reverse development takes place in the United Kingdom. Ultimately, in the very long term of course, both countries will be confronted with the same negative rate of growth of their capacity of production.
In our example, German positive wage impulses have initiated this overall process of stagnation. The United Kingdom will not be able to protect itself against this latter development, in spite of its rational wage policy within the framework of flexible exchange rates.
In the long term the nominal exchange rates will stabilize and imply an ultimate depreciation of the English pound, whereas the Deutsch Mark ultimately appreciates.
Between the initial and the ultimate period of analysis, the process of adaptation is showing a continuously depreciating English pound at a rate which corresponds with a lower English speed of monetary contraction compared with that of the Germans. This process of adaptation can be understood by pointing out again that the English negative rate of growth of production falls short (in the short and the medium term) of the corresponding negative rate in Germany.
All in all, the consequences of the aforementioned events ultimately imply definitively deteriorated terms of trade for the United Kingdom and, of course, the reverse situation is true for Germany. Because these terms of trade will compensate the balances on current account at constant prices for both countries, the corresponding balances on current account at current prices will always remain constant.
Finally, the foregoing analysis should make it clear that the EC countries will be confronted with very poor prospects for the future if the European markets and/or coordinating EC authorities fail to operate in the way we suggested in the present paper.

IV. Concluding remarks

The central issue in this paper concerns the influence of exchange rates on the European busines cycle. Using a 'quasi-empirical' two-country model, results have been derived which correspond strikingly with the poor economic performance Western Europe is confronted nowadays. The analysis started by elucidating why the European foreign currency market was in severe turmoil last year and still is in present days but, perhaps, also will stay in the future within the framework of an unstable European Monetary System. Financing the costs of the German (re)unification provoked too high nominal wage levels. In order to protect price and governmental-financial-deficit stability, German tax-increase and M1-contraction policy measures had been taken. This combination of an autonomously induced positive wage impulse and the consciously taken tax-increase and M1-contraction policy measures set the recessive movement of the German economy in motion. The analysis also showed how the downswing of the European business cycle had been initiated by this German policy. Consequently the Bank of England had to adopt

monetary policy measures that matched the constant-ratio requirement of its currency with respect to the German currency and actually implied that the United Kingdom had to follow the German contractive monetary policy. In case of the postulated sticky-price regime in the British goods market, the United Kingdom was also confronted with stagnation and became a victim of its own political conduct by keeping itself to the promise of maintaining the exchange rate of the English pound constant with respect to the Deutsch Mark.
The analysis firstly suggested a partial solution for the European troubles by consciously effecting a devaluation of the English pound or, under specific circumstances, by a successful devaluation caused by speculative operations against the English currency. However, an integral solution, aiming at an upturn of the European business cycle, will consist of a strong coordination of moderated nominal wages, lower tax rates, unchanged financial deficits of the EC governments and expansive monetary policy measures by the EC authorities. If this coordination remains undone and/or the European markets, in particular the labour markets, fail to operate the EC countries will be confronted with very poor economic performances in the future.
Finally, the analysis showed the benefits of flexible exchange rates in case of rigid EC labour markets. They could play a very useful role in mitigating the downward movement of real welfare in the downswing of the European business cycle. Moreover, the analysis roughly suggested that the flexible exchange rate system could play a useful role in mitigating the EC inflation rates in case of an upturn of the European business cycle. The latter conclusions remain true in the event that EC labourmarkets would permanently stay rigid.
All in all, the analysis showed why politicians actually have fundamental reasons to open to question the usefulness of a European Monetary Union within a framework of fixed exchange rates. The pros of the latter system probably are outweighed by its cons.

Notes:

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(1) At different Economic Modelling Conferences attention was paid to "Econometric versus quasi-empirical modelling" for policy analysis; see for instance van Els, P.J.A., Econometric versus quasiempirical models; Macroeconomic policy analysis in the Netherlands, Economic Modelling, Vol 7, no 2, April 1990, pp 133-147.

(2) Meulendijks, Pieter J.F.G,"De betekenis van reële en financiële internationalisatiegraden voor volkshuishoudingen" (On the significance of varying degrees of international economic and financial integration for economies), Wolters-Noordhoff bv Groningen, ISBN 90 01 58290 7, 1992.

(3) The (inter)national accounting identities (Balance sheets) of the inital situation, including the non-monetary sector as well as the financial relationships between the banks, the Central Bank, the Government, and the private non-banking sector are stated

for both countries in our article: "De monetaire inflatietheorie versus de reële stagflatie-theorie"(Monetary inflation theory vs real stagflation theory), Maandschrift Economie, Wolters-Noordhoff, Groningen, Jaargang 56, 1992, No 5. By aggregating the two-country model in section II, the closed model of "the European economy" can be derived together with the numerical values of its accounting identities.

(4) Driehuis, Wim, and Mulder, Rob J.,De q-theorie van het investeringsgedrag (The q theory of investment), forthcoming in Maandschrift Economie, Wolters Noordhoff, Groningen.

(5) The same kind of consequences, and likely being more realistic ones, could be obtained if it was postulated that the German unification implied extra governmental expenditures to be covered by extra wage taxes. These wage-tax-rate increases would set the shifting-process machine in motion which ultimately would be harmful for the profits of German enterprises. The latter possibility will not be considered explicitly in the present article. Nevertheless, financing the costs of the German unification provoked shifting processes leading to too high nominal wage levels.

(6) Note that in an open economy the two monetary targets of price stabilization and nominal exchange rate stabilization can never be reached in a simultaneous way.

Appendix I: Ratios and elasticities of the stationary equilibrium state

(1)	Ratio of private consumption to GVAE	$\hat{\gamma}=0.9$
(2)	Ratio of gross investment to GVAE	$\hat{\sigma}_{i_b}=0.1$
(3)	Labour income share (Ratio to NVAE)	$\hat{\lambda}_n=\frac{8}{9}$
(4)	Labour income share (Ratio to GVAE)	$\hat{\lambda}=0.8$
(5)	Substitution elasticity with respect to speculative money	$\varphi=1$
(6)	Ratio of imports or exports to GVAE	$\hat{\mu}=0.25$
(7)	Expenditure elasticity of imports	$\mu_x=1$
(8)	Substitution elasticity foreign produced goods with respect to home produced goods	$\sigma=1$

(9) Competitive price elasticity belonging to equation (7)	$\eta' = \sigma(1-\hat{\mu}) = 0.75$
(10) Output elasticity of imports	$\mu_y = \frac{\mu_x}{1-2\hat{\mu}\mu_x} = 2$
(11) Competitive price elasticity belonging to equation (10)	$\eta = \frac{\eta'}{1-2\hat{\mu}\mu_x} = 1.5$
Note! If we postulate	$2\eta - 1 = \mu_y$
it is true that	$S_b = \hat{\mu}(-2\bar{\bar{Y}} + p_w)$
If we also postulate	$\varphi = 1$
the reduced form of a few fundamental equations can be expressed in a very simple way, for instance:	
Actual stock-value of share capital:	$K^* = E - 4w'$
Yield on actual stock-value of share capital:	$\frac{r_i^*}{\hat{r}} = -4w'$
Real interest rate on public sector debt:	$\frac{r_o}{\hat{r}} = -E$
The GVAE-value:	$Y = E$
(12) Accelerator	$\zeta = 0.05$

(13)	Shares of domestic and foreign holdings of financial assets in total domestic financial assets, respectively	$a=0.5$ $(1-a)=0.5$
(14)	Capital output ratio	$\hat{\kappa}=2$
(15)	Ratio of total long-term lending to the public sector to GVAE	$\hat{\omega}=1$
(16)	Ratio M1 to GVAE	$\hat{\chi}=\frac{1}{3}$
(17)	Ratio of scrapping of technically obselete capital goods to GVAE	$\hat{\kappa}\hat{\delta}=0.1$
(18)	Elasticity of the output price with respect to the utilization rate of production capacity	$\xi=1;\infty$
(19)	Yield on share capital and real interest rate on public sector debt, after tax	$\hat{r}=$ $(1-\hat{\tau}_R)\hat{r}'=\frac{1}{30}$
(20)	Rate of taxes on non-wage income	$\hat{\tau}_R=\frac{1}{3}$
(21)	Yield on share capital and real interest rate on public sector debt	$\hat{r}'=0.05$
(22)	Ratio of taxes on non-wage income to GVAE	$\hat{\tau}_R\hat{\kappa}\hat{r}'=\frac{1}{30}$
(23)	Ratio of interest payments on public debt to GVAE	$\hat{\omega}\hat{r}=\frac{1}{30}$

(24)	Effect of the burden of taxation on wage formation	$\epsilon = \frac{4}{7}$
(25)	Elasticity of production capacity with respect to real labour costs	$\phi \frac{\hat{\lambda}_n}{1-\hat{\lambda}_n} = 0.8$
(26)	Ratio of disposable non-wage income to GVAE = Ratio of consumption of non-wage income earners to GVAE	$(\hat{\kappa}+\hat{\omega})\hat{r} = 0.1$

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